

IN THE SPECIFICATION:

Please replace the paragraph beginning on page 12, line 10 with the following amended paragraph.

When observing at low magnification (for instance, magnification $M=$ about 40 times), the distance a between the sample 4 and the grazing incidence mirror 5 is adjusted by shortening vacuum bellows 14 of the vacuum pipe 10 with the bellows such that the distance b between the grazing incidence mirror 5 and the X-ray detector 6 is set to about 800mm as shown in Fig. 5, and moving the sample 4 by the moving stage 8 so as to be focused while the image of the ~~X-ray detector 6~~ sample 4 is observed. The grazing incidence mirror 3 for illumination is moved by the moving stage 7 so as to obtain the optimum illumination.

Please replace the paragraph beginning on page 12, line 23 with the following amended paragraph.

On the other hand, when observing at high magnification (for instance, magnification $M=$ about 200 times), the distance a between the sample 4 and the grazing incidence mirror 5 is adjusted by extending vacuum bellows 14 of the vacuum pipe 10 with the bellows such that the distance b between the grazing incidence mirror 5 and the X-ray detector 6 is about 4000mm as shown in Fig. 6, and moving the sample 4 by the moving stage 8 so as to be focused while the image of the ~~X-ray detector 6~~ sample 4 is observed. The grazing incidence mirror 3 for illumination is moved by the moving stage 7 so as to obtain the optimum illumination.

Please replace the paragraph beginning on page 14, line 4 with the following amended paragraph.

As shown in Fig. 7, the X-ray detector of the second embodiment has a visible light source 21, mirrors 22 and 23 capable of being inserted and retracted in an optical path, liner motion feedthroughs 25 and 26 driving an inserting operation and a retracting operation in the directions of the arrows R and S of the mirrors, and a detector 24 having sensitivity to visible light in addition to the configuration of the first embodiment. In Fig. 7, the mirrors 22 [[22a]] and 23 [[23a]] indicated by solid lines show the state where the mirrors 22 [[22a]] and 23 [[23a]] are retracted from the optical path, and the mirrors 22 [[22b]] and 23 [[23b]] indicated by broken lines show the state where the mirrors 22 [[22b]] and 23 [[23b]] are inserted in the optical path.

Please replace the paragraph beginning on page 14, line 24 with the following amended paragraph.

The mirrors 22 [[22a]] and 23 [[23a]] are respectively inserted to the positions 22b and 23b on the optical axis, as shown by the positions of mirrors 22 and 23 indicated by broken lines, by driving the liner motion feedthroughs 25 and 26 in the observation of the low magnification (for instance, magnification $M=$ about 40 times) by the visible light for the sample exploration. Next, the visible light source 21 is turned on. The visible light is reflected by the mirror 22, and sample 4 is irradiated by the grazing incidence mirror 3 for illumination. The visible light penetrating through the sample 4 is reflected by the grazing incidence mirror 5. The visible light reflected is then reflected by the mirror 23, and is made incident to the detector 24. The distance between the grazing incidence mirror 5 and the detector 24 through the mirror 23 is set to about

800mm. The distance a between the sample 4 and the grazing incidence mirror 5 is adjusted by moving the sample 4 by the moving stage 8 so as to be focused while viewing the image detected by the detector 24, and the grazing incidence mirror 3 for illumination is moved in the optical axis direction by the moving stage 7 so as to obtain the optimum illumination. The same effect for illumination can be achieved even if the visible light source 21 is moved in the optical axis direction.

Please replace the paragraph beginning on page 15, line 24 with the following amended paragraph.

The mirrors 22 and 23 are respectively retracted to the positions, as shown by the positions of the mirrors 22 and 23 indicated by solid lines, 22a and 23a by the liner motion feedthroughs 25 and 26 when observing in detail at high magnification by using the X-ray after the desired position of the sample 4 is explored. The distance b between the grazing incidence mirror 5 and the X-ray detector 6 is set to about 2000mm when the magnification M is about 100 times. The X-ray detector 6 is moved such that the distance b between the grazing incidence mirror 5 and the X-ray detector 6 is about 4000mm when the magnification M is about 200 times. The distance a between the sample 4 and the grazing incidence mirror 5 is adjusted by irradiating the X-ray from the X-ray source 1, and moving the sample 4 by the moving stage 8 so as to be focused while observing the image in the X-ray detector 6, and the grazing incidence mirror 3 for illumination is moved in the optical axis direction by the moving stage 7 so as to obtain the optimum illumination.